IN THE DRAWINGS:

In the Office Action at item 1, the Examiner objected to FIGs. 3 and 5. In order to overcome these objections, replacement figures for FIGs. 3 and 5 are submitted herewith. In FIGs. 3 and 5, the arrow has been corrected to point from the decoder to the decoder complexity calculator, as described on page 6, paragraph [0033]. Approval of these changes to the Drawings is respectfully requested.

REMARKS

INTRODUCTION:

In accordance with the foregoing, claims 1, 10, 15, 18, 19, 20, 39, 48, 56, and 57 have been amended. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-58 are pending and under consideration. Claims 29-38 and 58 have been allowed. Reconsideration is respectfully requested.

OBJECTIONS TO THE DRAWINGS:

In the Office Action, at page 2, numbered paragraph 1, the drawings were objected to. Corrections to FIGs. 3 and 5 have been requested and replacement figures have been submitted herewith. Therefore, the outstanding drawing objections should be resolved.

Reconsideration and withdrawal of the outstanding objections to the drawings are respectfully requested.

CHANGES REQUESTED BY EXAMINER TO THE SPECIFICATION:

In the Office Action, at pages 2-3, numbered paragraph 2, the specification was objected to.

It is respectfully submitted that the Examiner may be confused by paragraph [0033] on pages 6-7 of the specification. Paragraph 33 of the specification recites:

> [0033] When the decoder 340 has completely decoded a previous frame, that is, an n-th frame (hereinafter, referred to as f(n)), the decoder complexity calculator 342 produces information on the amount of decoding computation performed on the previous frame f(n), that is, decoder complexity information, and transmits the decoder complexity information via a backward channel to the DCT computation amount controller 336 included in the encoder 320. If a ratio of the amount of processing of an IDCT computation to the amount of the decoding computation on the previous frame f(n) is $C_{IDCT}(n)$, the amount of computation that may be performed by the decoder is $C_{allowed}(n)$, and the actual amount of computation is $C_{total}(n)$, and decoder complexity information for k recently-decoded frames is $\{ C_{IDCT}(i), C_{allowed}(i) \ C_{total}(i) | i = n-k+1, ..., n \}$. Here, k denotes a variable that may be set selectively. (emphasis added)

That is, the complexity information utilized by the decoder includes three sets of information:

1) $C_{IDCT}(n)$ = a ratio of the amount of processing of an IDCT computation to the amount of the decoding computation on the previous frame f(n);

2) $C_{allowed}(n)$; and

3) $C_{total}(n)$.

In one embodiment, the encoder calculates a target DCT computation amount of the current frame f(n+1) based on decoder complexity information received from the decoder complexity calculator using Equation 6 (see paragraph [0045] of the specification):

$$C_t = \left(\sum_{j=n}^{n-k+1} \frac{C_{allowed}(j)}{C_{total}(j)} \right) \times \sum_{j=n}^{n-k+1} C_{IDCT}(j) \qquad ...(6)$$

Paragraph [0063] of the specification recites similar information, wherein "$C_{IDCT}(n)$" is recited in appositive form after "information on a ratio of the amount of processing of an IDCT computation to the total amount of computation performed in the decoder 540." As noted in paragraph [0050] of the specification, in one embodiment, "$C_{IDCT}(n)$" is "information on a percentage of the total amount of computation performed in the decoder 340 occupied by the amount of IDCT computation."

Hence, it is respectfully submitted that paragraph [0033] is clear to those skilled in the art. Reconsideration and withdrawal of the outstanding objections to the specification are respectfully requested.

REJECTION UNDER 35 U.S.C. §112:

In the Office Action, at pages 3-5, numbered paragraphs 3-10, claims 10-19 and 48-57 were rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth therein. This rejection is traversed and reconsideration is requested.

Claims 10 and 48 have been amended to change "the skipping of DCT" to ---a skipping of DCT--- as suggested by the Examiner.

Claim 18 has been amended to depend from claim 13 and "the threshold" in line 1 has been amended to recite ---a threshold---.

Claim 19 has been amended to depend from claim 13 and "the calculated threshold" in line 2 has been amended to recite ---a calculated threshold---.

Claim 56 has been amended to depend from claim 51 and "the threshold" in lines 1-2 has been amended to recite ---a threshold---.

Claim 57 has been amended to depend from claim 51 and "the calculated threshold" has been amended to recite ---a calculated threshold---.

Claim 15 has been amended to depend from claim 14 for clarity, as suggested by the Examiner.

Claim 24 has been amended to depend from claim 23 for clarity.

Hence, claims 10-19 and 48-57 are now submitted to be definite under 35 U.S.C. §112, second paragraph.

REJECTION UNDER 35 U.S.C. §103:

In the Office Action, at pages 5-8, numbered paragraphs 11-18, claims 1, 2, 4, 6, 7, 20, 21, 23, 25, 26, 39, 40, 42, 44, and 45 were rejected under 35 U.S.C. §103(a) as being unpatentable over Admitted Prior Art of Fig. 2 and paragraphs [0012 and [0013] on page 2 of the instant application (hereafter, APA) and further in view of Boyce et al. (USPN 5, 825,927; hereafter, Boyce) and Tan et al (USPN 6,542,549; hereafter, Tan). The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

Independent claim 1 has been amended to include in line 3, immediately after "complexity information," the terminology ---from a decoder---. This amendment is supported by paragraphs [0031]-[0035] of the specification.

Independent claim 20 has been amended to include in line 4, immediately after "complexity information," the terminology ---received from a decoder---. This amendment is supported by paragraphs [0031]-[0035] of the specification.

Independent claim 39 has been amended to include in line 4, immediately after "complexity information," the terminology ---from a decoder---. This amendment is supported by paragraphs [0031]-[0035] of the specification.

It is respectfully submitted that the claimed invention controls the skipping of DCT operations on the current image data based on the decoder complexity information representing an amount of decoding computation performed on previous image data which is received from a decoder.

However, Tan, as shown in FIG. 12 of same, discloses a video complexity verifier attached to the output of the encoder 301 and determines the processing speed requirements need by a video decoder by checking the bitstreams output from the encoder. Thus, Tan teaches a video complexity verifier (302) that checks the encoded bitstreams and calculates the time of the completion of the decoding of the pictures, while, in contrast, the claimed invention uses the amount of decoding computation performed on previous image data which is received from a decoder.

Further, Boyce does not disclose the claimed feature of using the decoder complexity information representing an amount of decoding computation performed on previous image data which is received from a decoder.

With respect to the APA, as pointed out in paragraphs [0014]-[0015] with respect to paragraphs [0012]-[0013] of the specification, the conventional motion image encoders have problems such as having a limit in the amount of computation that can be performed in a decoder, and the fact that an allocated computation amount and an actual computation amount may vary depending on circumstances so that when a bit stream encoded by a conventional motion image encoder is input, the decoder cannot properly encode the received bit stream or cannot make full use of the allocated computation amount. In addition, in conventional image encoders, the predetermined threshold value T is a fixed value within an image sequence, and the fact that DCT computation complexity varies for each macro block or frame is not considered, disabling real-time encoding of received motion image data.

Hence, even if combined, the APA, Tan and Boyce do not teach or suggest amended independent claims 1, 20 and/or 39 of the present invention.

Thus, amended independent claims 1, 20 and 39 are submitted to be patentable under 35 U.S.C. §103(a) over Admitted Prior Art of Fig. 2 and paragraphs [0012 and [0013] on page 2 of the instant application and further in view of Boyce et al. (USPN 5, 825,927) and Tan et al (USPN 6,542,549). Since claims 2, 4, 6, 7, 21, 23, 25, 26, 40, 42, 44, and 45 depend from amended claims 1, 20, and 39, respectively, claims 2, 4, 6, 7, 21, 23, 25, 26, 40, 42, 44, and 45 are patentable under 35 U.S.C. §103(a) over Admitted Prior Art of Fig. 2 and paragraphs [0012 and [0013] on page 2 of the instant application and further in view of Boyce et al. (USPN 5, 825,927) and Tan et al (USPN 6,542,549) for at least the reasons amended independent claims 1, 20 and 39 are patentable under 35 U.S.C. §103(a) over Admitted Prior Art of Fig. 2 and paragraphs [0012 and [0013] on page 2 of the instant application and further in view of Boyce et al. (USPN 5, 825,927) and Tan et al (USPN 6,542,549).

ALLOWABLE SUBJECT MATTER:

A. In the Office Action, at page 9, paragraph 19, claims 29-38 and 58 were allowed.

Applicants thank the Examiner for his careful review and allowance of said claims.

B. In the Office Action, at page 9, paragraph 20, claims 3, 5, 8, 9, 22, 24, 27, 28, 41, 43, 46, and 47 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Independent claims 1, 20, and 39 have been amended as noted above, and are submitted to be in allowable form. Since claims 3, 5, 8, 9, 22, 24, 27, 28, 41, 43, 46, and 47 depend from amended claims 1, 20 and 39, respectively, claims 3, 5, 8, 9, 22, 24, 27, 28, 41, 43, 46, and 47 are also in allowable form.

C. In the Office Action, at page 9, paragraph 21, the Examiner stated that claims 10 and 48 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, second paragraph. Dependent claims 11-17 and 49-55 would also become allowable as a result.

Applicants thank the Examiner for his careful review of claims 10 and 48. Claims 10 and 48 have been amended to overcome the rejections under 35 U.S.C. 112, second paragraph. Hence, it is respectfully submitted that claims 10-17 and 48-55 are now in allowable form.

D. In the Office Action, at page 9, paragraph 22, the Examiner stated that should claims 10 and 48 be rewritten or amended as set forth in the paragraph above (and therefore become allowable), then dependent claims 18, 19, 56 and 57 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph.

Claims 10, 48, 18, 19, 56 and 57 have been rewritten and are submitted to be in allowable form.

Applicants thank the Examiner for his careful review of the claims.

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot, and further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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